

REMARKS

Claims 1-19 are pending in the subject application. This amendment is provided in response to the Office Action dated June 24 2003. In that action, the Examiner made the requirement for restriction proper. The Examiner objected to claim 7. The Examiner rejected claims 1-18 under 35 U.S.C. § 112. The Examiner rejected claim 1 under 35 U.S.C. §102(e) as anticipated by Warnes et al. The Examiner rejected claims 2-18 under 35 U.S.C. §103(a).

The present invention is directed to a thermal barrier coating system having an improved life as a result of a preoxidation heat treatment of the platinum aluminide bond coat in a controlled atmosphere of preselected partial pressure of oxygen. The partial pressure of oxygen produces a thin and pure alumina layer free of contaminants and outward diffusion of aluminum in the form of oxide whiskers. The coating having this pure alumina layer exhibits improved FCT performance

The Examiner has made the election requirement final. Applicant does not withdraw the traversal at this time and requests the Examiner to reconsider. In the response to the restriction requirement, the Applicant previously requested the Examiner to identify an oxidizing material that does not produce oxygen for oxidation. The Examiner, in the most recent Office Communication, identified hydrogen oxide solution to provide an alumina layer. Preoxidation to form the pure alumina film is performed in a vacuum furnace at a temperature of between 1800°F and 2100°F. See specification at paragraph 24. Hydrogen peroxide has a chemical formula of H_2O_2 and dissociates into water and oxygen ($H_2O + O_2$) at temperatures well below the preoxidation temperature required. In fact, H_2O will also dissociate into $2H_2 + O_2$ well below the preoxidation temperature required. Thus, the Examiner has provided a source of O_2 and has not provided an alternate oxidizing material that can be utilized in the present invention. The Examiner's example confirms the Applicant's position that the Inventions I and II are not distinct and should be examined together.

Claim 7 has been amended to specify that the source of aluminum is a vapor phase source of aluminum and the exposure to the platinum is at a sufficiently high temperature. Claim 2 is silent regarding the particular source of aluminum and the temperature of the aluminum. Applicant requests withdrawal of the objection to Claim 7.

Claim 1 is rejected under 35 U.S.C. § 112 first paragraph. Claim 1 has been amended. The Examiner has interpreted the Detailed Description of the invention to require grit blasting of the bond coat. The Examiner is correct that providing a clean surface and surface roughness of between about 16 R_a and about 126 R_a is significant to the invention, and this has been added to claim 1. However, grit blasting one method, the preferred method, of achieving this cleanliness and surface roughness, but the invention is not so restricted.. The Examiner misinterprets the significance of paragraphs [30] and [31]. In Example 2, the surface that was chemically etched for cleanliness is not identified as having the required surface finish. Thus, even though the chemically etched sample was clean and preoxidized at a controlled partial pressure of oxygen, these processing steps were insufficient to produce the improvements to the life of the coating. Based on the amendment to claim 1, applicant requests withdrawal of the rejection of claim 1 based on 35 U.S.C. § 112.

Claims 2-18 are rejected under 35 U.S.C. § 112 as being indefinite. All average roughness values listed in the specification utilize the English convention of microinches, which is the common measurement system in the United States, and not the metric system. Thus, the common surface roughness values of 125 R_a , 63 R_a , 32 R_a , 16 R_a , 8 R_a using the English convention, which currently is the standard convention in the United States, corresponds respectively to 3.2 R_a , 1.6 R_a , 0.8 R_a , 0.4 R_a and 0.2 R_a in the metric system. In preparing the subject application, applicant had not considered the prospect of the application of metric units to surface roughness, in the absence of an explicit teaching to utilize surface roughness metric values. Given these drastic differences, metric values of 125 R_a , 63 R_a , 32 R_a , 16 R_a , and 8 R_a , being very rough, would be well outside the surface roughness range contemplated by the present invention. Applicants request withdrawal of the rejection under 35 U.S.C. § 112 based on the above.

Claim 1 is rejected under 35 U.S.C. § 102(e) as being anticipated by Warnes et al. As amended, claim 1 specifies a required surface finish range. It is not known what type of surface finish the grit blasting procedure of Warnes will produce, nor is it identified. Applicant requests withdrawal of the rejection under 35 U.S.C. § 102(e) based on Warnes et al.

Applicant also submits an affidavit that indicates the invention set forth in the present application was conceived and reduced to practice before the patent application of Warnes et al. set forth in U.S. Patent No. 6,472,418. Based on this affidavit, applicant submits that the rejection under 35 U.S.C. § 102(e) based on Warnes et al. should be withdrawn.

Claims 2-4, 6-11 and 14-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Warnes et al. (6,472,018) in view of EP 969117. Applicant traverses this rejection. Applicant notes that while Warnes et al. does disclose grit blasting in col. 5, at col. 6, Warnes et al. also discloses in col. 6 that grit blasting (and vapor honing) remove substantial portions of the Pt and Al-rich outermost additive layers, adversely affecting coating life and failing to produce an improvement in the life of the thermal barrier coated substrate. It is clear to one skilled in the art that Warnes et al. teaches away from both grit blasting and vapor honing. Therefore, Warnes et al. teaches away from claim 2. As set forth in MPEP §2145 X.D.2

References Cannot Be Combined Where Reference Teaches Away from Their Combination

It is improper to combine references where the references teach away from their combination. In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983) (The claimed catalyst which contained both iron and an alkali metal was not suggested by the combination of a reference which taught the interchangeability of antimony and alkali metal with the same beneficial result, combined with a reference expressly excluding antimony from, and adding iron to, a catalyst.).

Thus, the combination based on Warnes with EP 969117 is improper and the rejection of claims 2-4, 6-11 and 14-17 should be withdrawn. Applicant therefore requests withdrawal of this rejection.

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Warnes in view of EP 969117 as applied above, and further in view of Vakil (6,495,271).

Applicant traverses this rejection. The combination of Warnes et al. in view of EP 969117 is infirm for the reasons stated above, which are also applicable to this rejection. Vakil adds nothing to overcome this infirmity, and this rejection also should be withdrawn. Applicant therefore requests withdrawal of rejection of claim 5 based on this combination.

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Warnes in view of EP 969117 as applied above, and further in view of Murphy (5,716,720).

Applicant traverses this rejection. The combination of Warnes et al. in view of EP 969117 is infirm for the reasons stated above, which are also applicable to this rejection. Murphy adds nothing to overcome this infirmity, and this rejection also should be withdrawn. Applicant therefore requests withdrawal of rejection of claim 5 based on this combination.

Claims 1-4 and 6-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 969117 in view of Basta et al. (5,658,614) and Murphy (5,716,720). Applicant respectfully traverses this rejection. EP 969117 is distinguishable from the present invention. EP 969117 does not include a preoxidation step under a specified partial pressure of oxygen to form alumina scale, as claimed by the present invention, and does not disclose the required surface finishes claimed, nor does EP 969117 teach a single phase platinum aluminide. After application of the bond coat, which may be a diffusion aluminide, and grit blasting of the bond coat, the bond coat surface is subjected to deposition of a ceramic coating by an electron beam process in which the ceramic coating is deposited in a controlled atmosphere of oxygen-argon having a partial pressure of oxygen. See page 4, lines 31-33. While Basta et al. does add the single phase platinum aluminide bond coat, there is no motivation in either EP 969117 or Basta et al. to combine their teachings with Murphy in order to yield a separate preoxidation step under a

specified partial pressure of oxygen. As set forth in MPEP 2143.01 below, there must be a motivation to make the proposed combination:

THE PRIOR ART MUST SUGGEST THE DESIRABILITY OF THE
CLAIMED INVENTION

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." In re Linter, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In In re Fine, the claims were directed to a system for detecting and measuring minute quantities on nitrogen compounds comprising a gas chromatograph, a converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The examiner and Board asserted that it would have been within the skill of the art to substitute one type of detector for another in the system of the primary reference, however the court found there was no support or explanation of this conclusion and reversed.

In In re Jones, the claimed invention was the 2-(2-hydroxyethylamino)ethanol salt of dicamba, a compound with herbicidal activity. The primary reference disclosed inter alia the substituted ammonium salts of dicamba as herbicides, however the reference did not specifically teach the claimed salt. Secondary references teaching the amine portion of the salt were directed to shampoo additives and a byproduct of the production of morpholine. The court found there was no suggestion to combine these references to arrive at the claimed invention.

Here, there is no motivation to make the suggested combination in order to achieve a preoxidation step in EP 969117. Even if such motivation were provided, the combination would still not provide the critical surface finish limitations set forth in independent claims 1 and 2. As the prima facie case has been rebutted, applicant requests withdrawal of the rejection of claims 1-4 and 6-18 based on the combination of EP 969117 in view of Basta et al. and further in view of Murphy et al.

Claim 5 is further rejected under 35 U.S.C. § 103 (a) as being unpatentable over EP 969117 in view of Basta et al, further in view of Murphy et al. and further in view of Vakil. Applicant respectfully traverses this rejection. Claim 5 is dependent on claim 2 and includes all of the limitations of claim 2. Claim 2 is not obvious over the combination of EP 969117 in view of Basta et al. and further in view of Murphy et al. and therefore, claim 5 which includes further limitations also is not obvious over the proposed combination, even if Vakil further adds a method of depositing. A dependent claim that adds limitations to a non-obvious independent claim is also non-obvious. Applicant requests withdrawal of the rejection of claim 5 under 35 U.S.C. § 103 (a) as being unpatentable over EP 969117 in view of Basta et al, further in view of Murphy et al. and further in view of Vakil.

Applicant will provide the Examiner a terminal disclaimer upon notification that the subject application includes allowable subject matter.

CONCLUSION

In view of the above, Applicant respectfully requests entry of this amendment, reconsideration of the Application and withdrawal of the outstanding rejections. As a result of the amendments and remarks presented herein, Applicant respectfully submits that claim 1, as amended, is not anticipated by the cited prior art, nor are claims 2-19 rendered obvious by the cited art. As the claims are not anticipated by nor rendered obvious in view of the applied art, Applicant requests withdrawal of the outstanding rejections and allowance of claims 1-19. If the Examiner believes that prosecution of this Application could be expedited by a telephone conference, the Examiner is encouraged to contact applicant's attorney at the phone number listed below.

The Commissioner is hereby authorized to charge any additional fees and credit any overpayments to Deposit Account No. 50-1059.

Respectfully submitted,

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Attachment: Affidavit of Irene Spitsberg under 37 CFR § 1.131